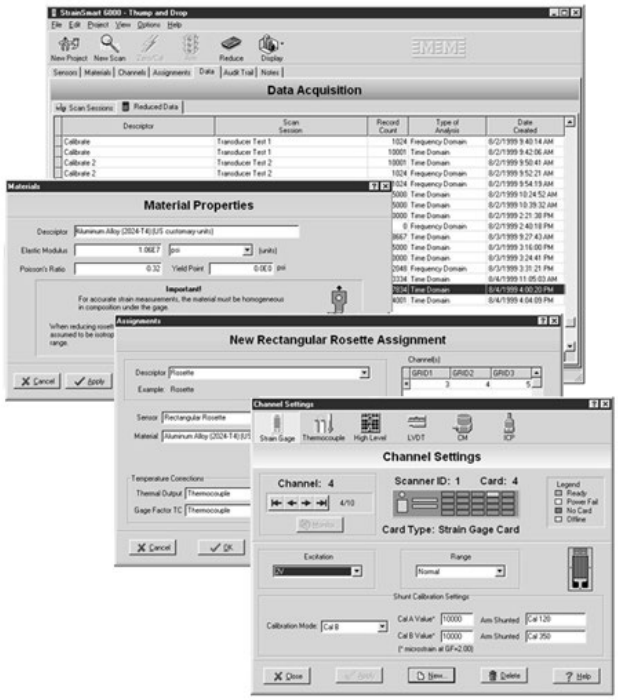
StrainSmart® Data Acquisition Software

StrainSmart® is a ready-to-use, Windows®-based software package for acquiring, reducing, presenting, and storing measurement data from strain gages, strain-gage-based transducers, thermocouples, temperature sensors, LVDTs, potentiometers, piezoelectric sensors, and other commonly used transducers.

It is designed to function seamlessly with a variety of Micro-Measurements instrumentation hardware, including System 7000 and System 8000. A unique version of this software is used to operate System 9000, called StrainSmart® 9000; for details, see the datasheet at:

www.micro-measurements.com/doc?11383



DESCRIPTION

Ready-to-use StrainSmart® software makes test setup fast and easy for strain gages, strain-gage-based transducers, thermocouples, temperature sensors, LVDTs, potentiometers, piezoelectric sensors, and other commonly used transducers. Using the parameters input for sensors, materials, and instrumentation hardware, StrainSmart® automatically outputs the results of the test data in engineering units. Test setups and measurement data can also be permanently stored for offline display or for use in databases, word processors, and spreadsheets.

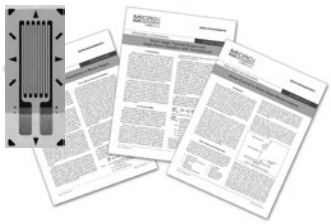
StrainSmart® has the capability to reduce data in both the time and frequency domains. FFT analysis may be elected for data acquired at scanning rates greater than 100 samples per second.

Accurate strain measurements require attention to the unique characteristics of the strain gage and measurement system—thermal output, temperature coefficient of gage factor, and transverse sensitivity of strain gages, as well as nonlinearity errors inherent in the Wheatstone bridge. StrainSmart® software takes these into account automatically.

All strain-gage bridges are scaled for the number of active bridge arms. Data from measurements with delta, rectangular, and tee rosettes can be reduced to principal strains and stresses, as well as the equivalent stresses for common failure mode criteria.

Fully reduced and corrected measurement data can be monitored online, and recorded at predetermined limits or at user-defined intervals.

THE STRAINSMART® ADVANTAGE



Strain gage technology is the stress/strain measurement technique most widely used around the world. Over the years, we have developed the tools necessary for accurate acquisition and understanding of strain gage measurements. The primary factors affecting strain gage and instrument performance are incorporated into our extensive selection of tech notes, application notes, instruction bulletins, and other technical publications that are recognized and used as the authoritative references for strain gage measurement by practitioners throughout the world. StrainSmart® software automatically applies the techniques and corrections covered by these publications to your test measurements.

STRAINSMART® SOFTWARE FEATURES

- Complete Windows®-based software designed for the experimental stress analyst
- Easy-to-use StrainSmart® Wizards for fast test setup and for data acquisition, reduction, and presentation
- Sensor-specific assignment of inputs (strain gages, thermocouples, etc.), as well as user-defined assignments for mathematical manipulation of measurement data
- One-touch autobalance
- Shunt calibration of strain-gage inputs
- Reduced data available offline as a database table, ASCII text, HTML or Microsoft Office™ (Word, Excel, Access) document, or online by OLE Automation connection to spreadsheets, word processors, LabView, and other third-party applications
- Online interactive Help system
- Test setup and commonly used parameters available for saving and reuse for subsequent testing

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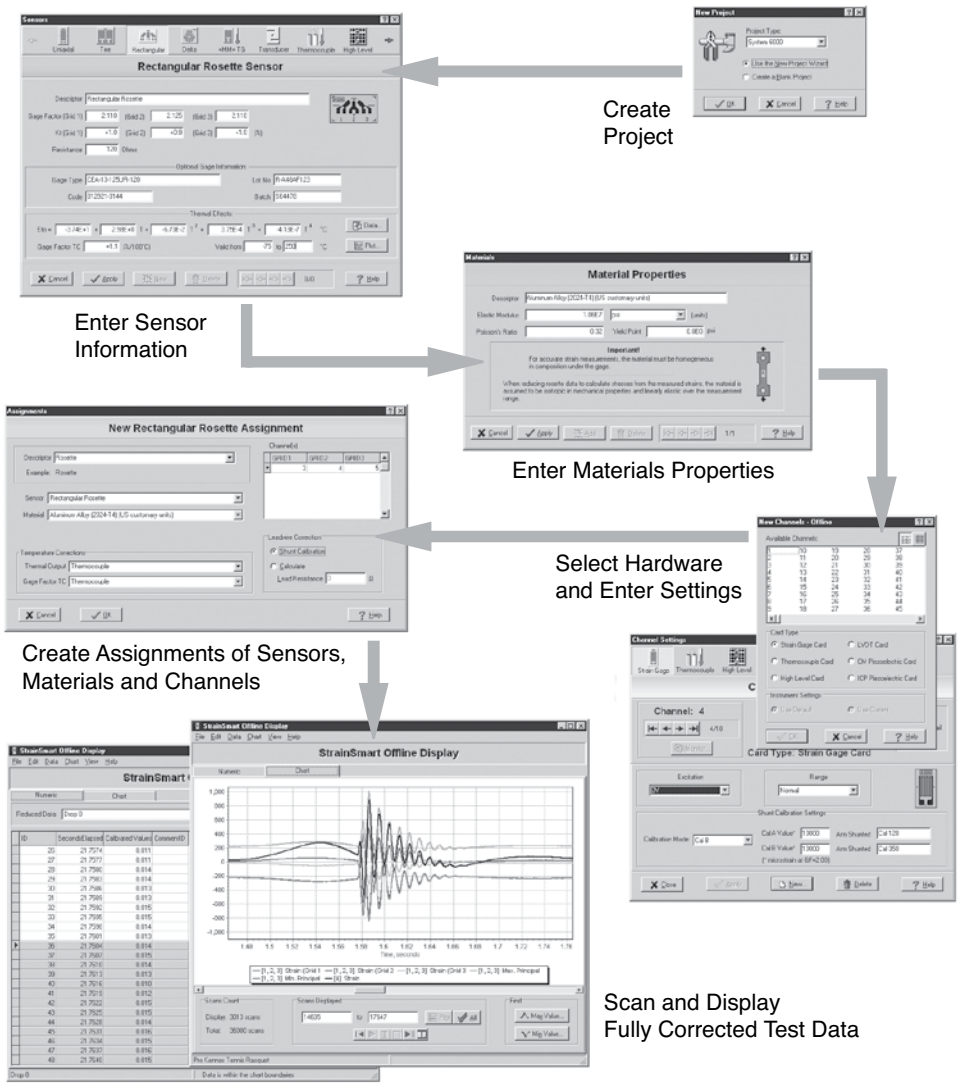
Software for Stress Analysis Testing

ACQUISITION/REDUCTION/PRESENTATION

- Data reduction for delta, rectangular, and tee rosettes, including the conversion of principal strains to stresses
- Calculation of equivalent stresses for common failure mode criteria
- Online monitoring of key channels and/or rosettes in fully reduced and corrected numeric and graphic formats
- Offline presentation of all reduced data in numeric and graphical formats
- FFT analysis
- Thermal output compensation
- Correction for temperature coefficient of gage factor
- Wheatstone bridge nonlinearity correction
- Transverse sensitivity correction
- Thermocouple linearization
- Scaling for number of active bridge arms
- Data storage for later analysis and processing
- Record on limits or user-defined time intervals
- Automatic audit trail
- Self calibration
- Barcode input of strain gage datasheet information

MULTI-CHANNEL MEASUREMENTS

Through StrainSmart® software, the appropriate setup information is entered—gage factor, materials properties, transducer sensitivities, etc. Using these parameters, StrainSmart® automatically outputs the results of test data in engineering units. Setup information and measurement data can also be permanently retained for offline display or for export to databases, word processors, and spreadsheets.



For technical questions, contact
mm@vpgsensors.com

Software for Stress Analysis Testing

SYSTEM 7000

- 10 to 2048 measurements per second per sensor
- Selectable digital filtering of measurement signals
- Time and frequency domain analysis
- Self calibration with internal calibration reference

SYSTEM 8000

- Eight software-selectable input channels
- Up to 16 scanners can be used concurrently
- Supported inputs include:
  - Strain gage (strain gauge) (quarter-, half-, and full-bridges)
  - Strain-gage-based transducer
  - High-level voltage signal
  - Thermocouples
- RJ45 input connectors for each input channel
- Scanning rates are 1000, 500, 200, 100, and 10 samples/second
- Compact size and ruggedized enclosure
- Ethernet network architecture
- Optional self-calibration functionality available

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